

Air Pollution in Early Childhood

Bernard van Leer  FOUNDATION



Photo: Jacob Krupnick/Wild Combination

▶ In brief

Air pollution is a global health emergency and young children are the most vulnerable. Polluted air causes long-lasting damage to babies and toddlers, whose brains and bodies are still developing and who breathe in more toxic air than adults. A comprehensive set of policies are needed to reduce emissions at source, while protecting children from the pollution which already exists.

3 THINGS TO REMEMBER

- ▶ Air pollution inflicts short- and long-term damage on children, impairing development and causing chronic health problems
- ▶ Young children are most vulnerable, as they breathe more air and travel or play close to sources of pollution – like vehicle exhausts
- ▶ Action is needed at all levels, from national clean energy policies to mapping local pollution to protect children

▷ What do we know?

Substantial evidence has demonstrated the profound negative impacts of air pollution on young children.

Even in the womb, children are not protected. During pregnancy, for example, maternal exposure to pollutants – such as PM2.5 (a range of fine particles, including black carbon) – is almost as bad for the foetus as smoking.¹ Increasing the likelihood of premature birth,² low birth weight,³ miscarriage⁴ and cognitive impairment as a child.⁵ Research released in September 2019 proved for the first time that unborn foetuses can be directly exposed to pollution particles via the placenta.⁶

After birth, the significant effects continue. Prolonged exposure to air pollution at a young age, for example, can lead to a reduction in lung function⁷ and a greater likelihood of asthma diagnosis as a child.⁸ Meanwhile, children living in high-pollution areas have been found to perform worse in school.⁹

Young children are particularly vulnerable due to their stage in development, but also due to the contexts in which they live. For example, three-year-olds breathe in twice as much air as adults per unit body weight,¹⁰ and play closer to the ground – where particulate matter is often more concentrated.



Photo: Courtesy of Pete Milnes

▷ In numbers



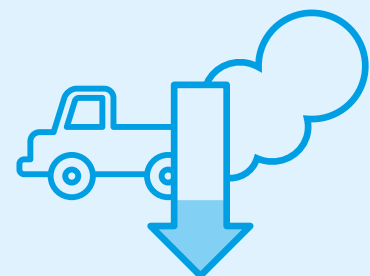
2x more

air inhaled by three-year-olds compared to adults, per unit body weight¹¹



17 million

babies live where air pollution is 6x international safety guidelines¹²



38%

fewer polluting vehicles in London's ultra-low-emissions-zone, after six months¹³

▷ Why does it matter?

Air pollution is hurting the health and future potential of millions of children around the world. Each year, nearly 600,000 children under five die from diseases caused or exacerbated by its effects.¹⁴

Both indoor and outdoor pollution have an outsized impact on young children. Heavy traffic in cities, for example, produces dangerous particles at the height of toddlers. In low-income rural areas, meanwhile, young children spend a disproportionate amount of time with their mothers in homes which use polluting biomass fuels for cooking and heating.¹⁵

With 93% of the world's children breathing toxic air every day,¹⁶ pollution is a problem in all corners of the globe. However, a lack of quality nutrition and healthcare puts children from lower-income countries at even higher risk: a child's pre-existing health can determine the degree to which air pollution impacts them.¹⁷

Not only does air pollution threaten young lives, but the resulting issues represent a significant economic burden to nations. By 2060, the OECD estimates that the impacts will have reached costs of 1% of global GDP.¹⁸ Air pollution also contributes significantly to climate change, especially through short-lived climate pollutants like black carbon.¹⁹

Children don't have the power to change their environment, while parents and caregivers are limited in what they can do to protect young children from exposure. Actually solving the issue requires a societal response to address the sources of pollution.

KEY ISSUES

- ▷ Clean energy
- ▷ Climate change
- ▷ Transportation
- ▷ Urban design

Young children are exposed to 30% more black carbon from car exhausts than adults²⁰



▷ What can policymakers do?

Air pollution is a global, regional and local issue all at the same time. Therefore, different solutions are needed at each policy level, from international commitments to tackle global emissions – such as the United Nations’ Clean Air Initiative – to street-level urban planning. Only comprehensive, coordinated action will make the air cleaner for young children.

Here are some of the most important interventions:

▷ **REGULATE TRAFFIC** and encourage walking and cycling to reduce emissions and protect children. This can include rerouting vehicles from kindergartens, and reclaiming streets for car-free, mixed-use public spaces.



Arizona, along with other US states, has been developing a ‘**no idling**’ policy for school buses to protect children from air pollution. Recognising the vulnerability of children to vehicle emissions, the draft plan includes buses parking at least 100 feet (30 metres) away from schools and shutting off the engine when they arrive.²¹

▷ Increase the use of **CLEAN ENERGY**, from heavy industry to public transport. Shenzhen, for example, has created the world’s first fully-electric bus fleet.²²

▷ Create **GREEN SPACES** to improve air quality, such as by encouraging tree planting. “Greening” drives have been gaining momentum in cities around the world like Paris and Rotterdam.



In India, the government’s **Ujjwala programme** has supplied more than 80 million liquefied petroleum gas (LPG) cooking stoves to low-income rural women.²³ However, because the refills are expensive, the policy has failed to create a full transition away from cheaper, polluting fuels like wood, dung or coal.²⁴

▷ **TRANSITION HOUSEHOLDS** to cleaner energy sources to reduce indoor pollution. This is a particular issue in developing countries, and especially in rural communities.

For all of these interventions, organising and advocating around young children’s experience of air pollution can be a powerful tool.

In Turin, for example, the Bernard van Leer Foundation’s Urban95 Initiative equipped parents of young children with low-cost air quality monitoring devices to map air pollution in the city, helping parents avoid concentrated areas and raising public awareness.

Cleaning London's toxic air

▷ PUTTING A HIGH PRICE ON POLLUTING VEHICLES

THE PROBLEM:

Pollution in London is damaging child health and development, including during pregnancy,²⁵ and contributes to more than 9,000 premature deaths each year.²⁶

THE SOLUTION:

A strict ultra-low emissions zone in the city centre, combined with huge investment in more sustainable modes of transport.

THE IMPACT:

After six months, there were 38% fewer polluting vehicles in the low emissions zone, significantly reducing pollutants like nitrogen dioxide.²⁷

HOW DOES IT WORK? London introduced an ultra-low emissions zone (ULEZ) in April 2019 to cut down on polluting vehicles. Among the strictest low emissions zones in the world, it became the world's first to operate 24 hours a day.²⁸ The city has also funded audits to assess air quality in schools and nurseries, and is nearly doubling funding to tackle air pollution overall.²⁹

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“Children's health has been a real motivator in improving air pollution in London”

- Matt Whitney,
Analyst at Clean Air Fund

Millions of Londoners are living with illegal levels of pollution – according to EU law – with especially dangerous levels of nitrogen dioxide caused by diesel vehicles.³⁰ Not only are these pollution levels causing thousands of premature deaths, but studies have shown their damage on child health and development.³¹ In particular, children in London's deprived areas suffer from the worst levels of pollution.

Efforts to improve London's air quality include action at all levels, from the mayor's policies to street-level initiatives. Alongside City Hall's ULEZ, local authorities are also introducing measures, including fining parked drivers caught with their engines idling.³²



Photo: Kristian Bullus

On the street level, a comprehensive, low-cost air quality monitoring system has been launched, called Breathe London. Equipping advocates and policymakers with hyperlocal data, it includes giving children monitors in their backpacks to measure pollution on their route to school.³³ Meanwhile, audits are taking place of air quality levels in schools and nurseries, followed by support to test air quality interventions like anti-idling and “barrier bushes” to protect playgrounds.³⁴

The ULEZ has already had a significant impact. Compared to February 2017, nitrogen dioxide levels were 36% lower in September 2019. However, if London is to meet WHO air quality guidelines by 2030, much more must be done.³⁵ A whole range of actions are needed, from investment in public transport and cycling infrastructure to the expansion of the ULEZ.

[READ MORE](#)

Bernard van Leer Foundation

An Urban95 Starter Kit

<https://bernardvanleer.org/publications-reports/an-urban95-starter-kit-ideas-for-action/>

- ▶ For: ideas for action and implementation guidance for cities

Clean Air Fund

The State of Global Philanthropy on Air Quality

<https://www.cleanairfund.org/assets/documents/Clean-Air-Fund-Report.pdf>

- ▶ For: a review of current philanthropic support to clean air programmes and recommendations for more impactful grant-making

UNICEF

Clear the air for children

https://www.unicef.org/publications/index_92957.html

- ▶ For: how children are affected by air pollution around the world

World Health Organization

Air pollution and child health

<https://www.who.int/ceh/publications/air-pollution-child-health/en/>

- ▶ For: the latest science on the risks for child health

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